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UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Gomez et al.
Application No.: 09/886,414

Confirmation No.: 5748

Filing Date: June 21, 2001

Examiner: Mouttet, B.

Title: METHOD FOR SERVICING A PEN WHEN MOUNTED IN A PRINTING DEVICE

Group Art Unit: 2853

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith in triplicate is the Appeal Brief in this application with respect to the Notice of Appeal filed on May 27, 2004.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$330.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

() (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

() one month	\$110.00
() two months	\$420.00
() three months	\$950.00
() four months	\$1480.00

() The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of **\$330.00**. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

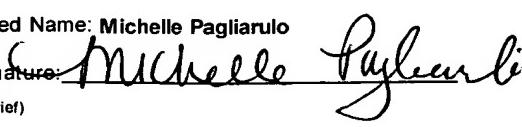
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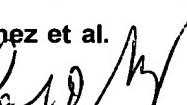
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Gomez et al.

By



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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants: Gomez et al.)
Serial No.: 09/886,414) Art Unit: 2853
Filing Date: June 21, 2001) Examiner: Mouttet, B.
Title: METHOD FOR SERVICING A PEN) Confirmation
WHEN MOUNTED IN A PRINTING) No.: 5748
DEVICE)

**Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**

APPELLANTS' APPEAL BRIEF

Dear Sir:

This is an appeal from the Final Rejection of Claims 1, 2 and 4-27 by the Primary Examiner in Art Unit 2853 on January 29, 2004.

Jurisdiction of this appeal results in the Board of Patent Appeals and Interferences under the provisions of Section 134, Title 35, United States Code, by way of a Notice of Appeal and requisite fee mailed to the USPTO with Certificate of Mailing on May 27, 2004.

07/27/2004 NROCHAI 00000072 082025 09886414

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(1) **REAL PARTY IN INTEREST**

The real party in interest in this Application is the recorded assignee, Hewlett-Packard Company, P.O. Box 272400, Fort Collins, CO 80527-2400, by way of an Assignment recorded October 19, 2001 at Reel 012290, Frame 0524.

(2) **RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

(3) **STATUS OF CLAIMS**

- (a) Claims canceled: None.
- (b) Claims withdrawn from consideration: None.
- (c) Claims pending: Claims 1-27.
- (d) Claims allowed: Claim 3.
- (e) Claims rejected: Claims 1, 2 and 4-27.
- (f) Claims on appeal: 1, 2 and 4-27.

(4) **STATUS OF AMENDMENTS FILED SUBSEQUENT TO FINAL REJECTION**

An Advisory Action dated April 28, 2004 indicates that the Amendment filed on April 1, 2004 would not be entered upon the timely submission of a Notice of Appeal and Appeal Brief with the requisite fees. This Amendment amended claims 1 and 14 in an attempt to advance the prosecution. However, it is submitted that claims 1, 2 and 4-27 as rejected in the final Office Action are patentable as discussed in the following Arguments.

(5) **SUMMARY OF THE INVENTION**

The present invention relates to an inkjet printing device and a method for servicing a pen in an inkjet printing device.

As noted in the specification at pages 2-4, an inkjet printer includes a pen that has an orifice plate with an array of nozzles. The pen is scanned back and forth in a print zone adjacent a media with the pen being controlled to selectively shoot or fire drops of ink onto the media to form an image thereon. The printing operation can be adversely affected by contaminant buildup on the

orifice plate, accumulation of different colors of ink, dried ink and the like. For this reason, the orifice plate and nozzles are frequently cleaned with a spit, wipe, spit procedure. In some printers this procedure is performed at the end of a print job based on certain criteria such as the number of drops fired since the last procedure, the time a pen has been uncapped, upon a user request, when power has first been applied to the printer. Although procedures like the spit, wipe, spit procedure are desirable to clean the pen, they contribute to (a) an increased print time and (b) a shorter pen life by degrading the surface of the orifice plate.

U.S. Patent No. 5,455,608 performs a nozzle health detection before a print job and performs a sequence of recovery procedures based on a fixed threshold of at least one nozzle remaining non-firing. That is, the pen is judged “able to print” or “unable to print” based solely on the number of nozzles either working or not working. The sequence continues until all nozzles are firing or until a predetermined number of procedures has been performed. The system may continue to run the procedure for other print jobs until the pen is fully recovered or replaced. This leads to an unacceptable loss of printer throughput and productivity as well as to orifice plate degradation.

In one embodiment of the inkjet printing device of the present invention an ink drop detector detects the operating characteristics of a plurality of nozzles to be used to print a print job. A processor (a) determines a level of print quality required for a received print job, (b) compares the operating characteristics to the required level of print quality and (c) if the operating characteristics are sufficient to meet the level of print quality, causes the printer to print the print job. The level of print quality for the print job is based on a set of flexible criteria rather than on a fixed threshold, such as a number of working nozzles. As described at page 12, the set of flexible criteria includes print modes, specified resolution, printer setting and/or size of area for the image to be printed.

In another embodiment of the inkjet printing device of the present invention, the processor operates to perform a recovery procedure in the event the operating characteristics of the plurality of nozzles are insufficient to meet the level of print quality.

In an embodiment of the method of the present invention, the print job is received; the required level of print quality is determined based on the set of flexible criteria; and the operating

characteristics of the nozzles to be used in the print job is detected and compared to the required level of print quality. In the event, based on the comparison, the operating characteristics are sufficient to meet the required level of print quality, the print job is printed.

In another embodiment of the method of the present invention, the method performs a recovery procedure in the event the operating characteristics of the plurality of nozzles is insufficient to meet the level of print quality.

(6) **ISSUES**

The issues presented for appellate determination by way of this Appeal are the propriety of the Final Rejection of the appealed claims on the following grounds:

- (a) the rejection of claims 1, 2, 4-7, 14-19, 26 and 27 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 6,056,386 to Nohata et al., hereafter Nohata.
- (b) the rejection of claims 8, 9, 11, 20, 21 and 23 under 35 U.S.C 103(a) as unpatentable over Nohata in view of U.S. Patent No. 5,398,054 to Fukazawa et al., hereafter Fukazawa.
- (c) the rejection of claim claims 9, 10, 24 and 25 under 35 U.S.C 103(a) as unpatentable over Nohata in view of U.S. Patent No. 5,583,547 to Gast et al., hereafter Gast.
- (d) The rejection of claims 12, 13, 24 and 25 under 35 U.S.C 103(a) as unpatentable over Nohata in view of U.S. Patent No. 5,455,608 to Stewart et al., hereafter Stewart.

(7) **GROUPING OF THE CLAIMS**

With respect to issue (a), Claims 2, 4-7 and 26, which depend from Claim 1, stand or fall with Claim 1. Claims 13-19, which depend from claim 14, stand or fall with claim 14.

With respect to issue (d), Claims 13 and 25, which depend from Claims 12 and 24, respectively, stand or fall with Claim 12 and 24.

(8) **ARGUMENTS**

Issue (a)

PTO'S POSITION

The PTO's position concerning the rejection under 35 U.S.C. 102(b) is set forth at the pages of the final Office Action designated below:

Independent Claim 1	Pages 2, 3, 7 and 8
Independent claim 14	Pages 3 and 4
Dependent claims 2, 4, 5 and 15-18	Page 4

ARGUMENT 1.

Nohata lacks the feature of determining a level of print quality required for a print job, wherein the level of print quality is based on a set of flexible criteria.

DISCUSSION

The Examiner reads the elements of claims 1 and 14 on the second embodiment of Nohata, particularly, Fig. 11A and accompanying description beginning at column 15, line 65. Nohata uses a fixed threshold, namely the threshold values Nb, Ny, Nm and Nc. Nohata uses one set of threshold values for normal printing and another set of threshold values for economy printing. See column 16, lines 30-52. In either case, once stored in ROM 26 of controller 24, Nohata's thresholds are fixed.

At page 8 of the final Office Action, the Examiner contends that it cannot be seen how basing the level of print quality on flexible criteria "distinguishes applicants' invention from that of Nohata

since the set quality of Nohata is based on a desired resolution and print coverage determined by a user which are similar criteria as that defined by applicants as being flexible. See column 3, lines 44-51 and column 17, lines 20-35 of Nohata”.

Neither of the cited passages supports a teaching that Nohata makes a level or threshold determination based on a set of flexible criteria. The column 3 passage refers to a previously known printer (not taught by Nohata) that uses fixed thresholds for normal and economy print modes in which a printed image includes faint portions at 30% in the normal print mode and at 60% in the economy print mode. Nohata does not identify the previously known printer or teach that the previously known printer is used in the Figs. 11a and 11b embodiments relied on in Issue (a) rejection. As such, the column 3 passage does not support the Examiner’s above noted contention.

The column 17 passage states that all of Nohata’s nozzles are used in a normal print mode to provide a 360dpi x 360dpi image and half are used in an economy print mode to provide a 360dpi x 180dpi image. That is, the economy print mode image is degraded vis-à-vis the normal print mode image, which is a characteristic of known normal print mode and economy mode images. The point is: in Nohata’s normal mode or in Nohata’s economy mode, the thresholds are fixed and entered into ROM 26. The choice of normal or economy printmode is made by a user selection from the panel 58. Thus, Nohata’s step S102 merely reads the position of the user operated mode switch and makes no determination of a threshold or a level of print quality based on flexible criteria. Based on the switch position, Nohata uses one of two fixed thresholds. Nohata makes a judgment to print or not to print based on the position of a user operated switch and not based on a set of flexible criteria. Nohata uses no other criteria to establish the threshold.

In contrast Nohata’s single criteria of normal or economy print mode, the present invention uses a set of flexible criteria to make a determination of level of print quality required for the received print job. The flexible criteria may include user entered parameters as well other parameters for the received print job. The parameters, for example, include print modes (e.g., normal and economy print modes as well as other print modes), specified resolution, printer setting and/or size of area for the image to be printed. Based on a set of these parameters, the determination of level of quality required for the received print job is made by the print device or the processor.

This level can vary from job to job. In contrast, Nohata merely chooses between two fixed thresholds for normal or economy mode.

Thus, Nohata lacks a determination of a level of print quality for a print job that is based on a set of flexible criteria as recited in independent claims 1 and 14 and their respective dependent claims 2, 4-7, 26 and 27 and 15-19. Therefore, the FINAL rejection of claims 1, 2, 4-7, 14-19, 26 and 27 under 35 U.S.C. 102(B) is erroneous and should be reversed.

ARGUMENT 2.

Nohata lacks the feature that in the event, based on the comparison, that the operating characteristics of the plurality of nozzles are sufficient to meet the required level of print quality, printing the print job.

DISCUSSION

The Examiner alleges that Nohata's step S104 and description at column 18, lines 53-55, provides this feature. However, step S104 is performed before any of the ink discharge tests (steps S105 – S111b) are performed to produce the operating characteristics.

In contrast, the instant feature of the claimed invention prints the print job after the operating characteristics have been detected and compared.

Thus, Nohata lacks the feature that in the event, based on the comparison, that the operating characteristics of the plurality of nozzles are sufficient to meet the required level of print quality, print the print job as recited in claims 1 and 14 and their respective dependent claims 2, 4-7, 26 and 27 and 15-19. Therefore, the FINAL rejection of claims 1, 2, 4-7, 14-19, 26 and 27 under 35 U.S.C. 102(B) is erroneous and should be reversed.

Issue (b)

PTO'S POSITION.

The PTO's position concerning the rejection under 35 U.S.C. 103(a) is set forth at page 5 of the final Office Action.

ARGUMENT 1.

The combination of Nohata and Fukazawa lacks the features noted in Arguments 1 and 2 of Issue (a) that are recited in the parent claims of the rejected dependent claims.

DISCUSSION

Nohata lacks the features that are noted above in Arguments 1 and 2 of Issue (a) and that are recited in the respective independent claims 1 and 14 of dependent claims 8, 9 and 11 and 20, 21 and 23. The Examiner does not allege that Fukazawa teaches the features that Nohata lacks. Thus, the combination of Nohata and Fukazawa does not contain all of the elements recited in claims 8, 9, 11, 20, 21 and 23. Therefore, the FINAL rejection of claims 8, 9, 11, 20, 21 and 23 under 35 U.S.C. 103(a) is erroneous and should be reversed.

Issue (c)

PTO'S POSITION.

The PTO's position concerning the rejection under 35 U.S.C. 103(a) is set forth at pages 5 and 6 of the final Office Action.

ARGUMENT 1.

The combination of Nohata and Gast lacks the features noted in Arguments 1 and 2 of Issue (a) that are recited in the parent claims of the rejected dependent claims.

DISCUSSION

Nohata lacks the features that are noted above in Arguments 1 and 2 of Issue (a) and that are recited in the respective independent claims 1 and 14 dependent claims 9 and 10 and 24 and 25. The Examiner does not allege that Gast teaches the features that Nohata lacks. Thus, the combination of Nohata and Gast does not contain all of the elements recited in claims 8, 9, 11, 20, 21 and 23. Therefore, the FINAL rejection of claims 9, 10, 24 and 25 under 35 U.S.C. 103(a) is erroneous and should be reversed.

Issue (d)

PTO'S POSITION.

The PTO's position concerning the rejection under 35 U.S.C. 103(a) is set forth at pages 6 and 7 of the final Office Action.

ARGUMENT 1.

The combination of Nohata and Stewart lacks the feature of determining a level of print quality required for a print job, wherein the level of print quality is based on a set of flexible criteria.

DISCUSSION

As noted above in Argument 1 of Issue (a), Nohata lacks this feature. Stewart also lacks this feature. At page 3 of the Applicants' specification, Stewart is described as performing a "nozzle health" detection before each print job and recovery procedures based on a fixed threshold. The threshold is basically one nozzle remaining non-firing. If after four tries, the nozzle still

remains non-firing, the fixed threshold dictates that the print job be deferred until after the printer is manually serviced. This causes an interruption, leading to an unacceptable loss of printer throughput and productivity. Thus, Stewart, like Nohata, merely uses a fixed threshold and not a set of flexible criteria as recited in claims 1 and 14, the parent claims of claims 12 and 13 and 24 and 25, respectively.

However, the suggested combination of Nohata and Stewart does not make a determination of level of print quality for a received print job based on a set of flexible criteria. Moreover, Stewart teaches away from any determination of level of print quality, because Stewart requires the printhead to be fully functional to print so as to print at full quality. Essentially, the combination of Nohata and Stewart, upon detection that a printhead cannot pass a fixed threshold, automatically performs a recovery function to fully recover the printhead. If the printhead does not fully recover, then the combination system posts an error message and does not print the job. In the combination system, it is irrelevant that a partially functional printhead is actually capable of printing a job at a determined level of print quality that is lower than the full quality, because Stewart will stop the printing. Therefore, it is submitted that claims 12, 13, 24 and 25 are not obvious in view of the combination since it lacks the claimed determination of level of print quality required for the received print job based on a set of flexible criteria.

Thus, the combination of Nohata and Stewart does not determine a level of print quality required for a print job, wherein the level of print quality is based on a set of flexible criteria as recited in independent claims 1 and 14 of dependent claims 12 and 13 and 24 and 25, respectively. Therefore, the FINAL rejection of claims 12, 13, 24 and 25 under 35 U.S.C. 103(a) is erroneous and should be reversed.

ARGUMENT 2.

The combination of Nohata and Stewart does not perform a recovery procedure in the event that the operating characteristics of the plurality of nozzles are not sufficient to meet the level of print quality.

DISCUSSION

The level of print quality recited in claims 12 and 24 refers to the required level of print quality based on a set of flexible criteria as recited in independent claims 1 and 14. As noted above in Argument 1 of Issue (d), neither Nohata nor Stewart teach a level of print quality based on a set of flexible criteria. Accordingly, neither Nohata nor Stewart nor the suggested combination thereof teaches to perform a recovery procedure in the event that the operating characteristics of the plurality of nozzles are not sufficient to meet the required level of print quality that is based on a set of flexible criteria.

Therefore, the FINAL rejection of claims 12, 13, 24 and 25 under 35 U.S.C. 103(a) is erroneous and should be reversed.

ARGUMENT 3.

There is no motivation to combine Nohata and Stewart.

DISCUSSION

The Office Action suggestion to use Nohata in combination with Stewart is improperly based on the hindsight of Applicants' disclosure. Such hindsight reconstruction of the art cannot be the basis of a rejection under 35 U.S.C. 103. There must be some teaching, suggestion, or modification to combine references. In re Lee, 61 USPQ 2d 1430, 1433, 1434 (CAFC 2002). In re Rouffet, 47 USPQ 2d 1453, 1456 (CAFC, 1998). In re Laskowski, 871 F.2d 115, 117, 10 USPQ 2d 1397, 1398-1399 (CAFC, 1989). "The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made." Sensonics Inc. v. Aerosonic Corp., 38 USPQ 2d 1551, 1554 (CAFC, 1996), citing Interconnect Planning Corp. v. Feil, 774 F. 2d 1132, 1138, 227 USPQ 543, 547 (CAFC, 1985). There is no suggestion or motivation for one of ordinary skill in the art at the time the invention was made to use the recovery operation of Stewart in Nohata.

Therefore, the FINAL rejection of claims 12, 13, 24 and 25 under 35 U.S.C. 103(a) is erroneous and should be reversed.

PRAYER FOR RELIEF

Reversal of the Final Rejection of Claims 1, 2 and 4-27 and an indication of the patentability of said claims over the references is respectfully requested.

Respectfully submitted,

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A P P E N D I X

(9) APPEALED CLAIMS

A copy of the claims on appeal is set forth in this Appendix.

1. A method of servicing a pen in an inkjet printing device, said pen comprising a plurality of nozzles, said method comprising:

receiving a print job;

determining a level of print quality required for said print job, wherein said level of print quality is based on a set of flexible criteria;

detecting the operating characteristics of a plurality of nozzles to be used to print said print job; and

comparing said operating characteristics of said plurality of nozzles to said required level of print quality for said print job and, in the event, based on the comparison, that said operating characteristics of said plurality of nozzles are sufficient to meet said level of print quality, printing said print job.

2. The method of claim 1, wherein said set of flexible criteria includes a resolution of said print job.

3. The method of claim 1, wherein said set of flexible criteria includes a single and a multipass printmode of said print job.

4. The method of claim 1, wherein said set of flexible criteria includes a setting of said inkjet printing device.

5. The method of claim 1, wherein said set of flexible criteria includes an amount of media area required for said print job.
6. The method of claim 1, wherein detecting the operating characteristics of a plurality of nozzles further comprises performing a drop detection test on said plurality of nozzles.
7. The method of claim 1, further comprising scheduling a maintenance procedure in the event that an individual one of said nozzles is not fully functional.
8. The method of claim 7, wherein said maintenance procedure is scheduled to be performed during a time when said inkjet printing device is idle.
9. The method of claim 7, wherein said maintenance procedure includes performing a wiping procedure on said pen.
10. The method of claim 1, further comprising after printing said print job, performing a wiping procedure on said pen in the event that a predetermined number of ink drops per nozzle has been exceeded.
11. The method of claim 1, further comprising after printing said print job, performing a wiping procedure on said pen in the event that said inkjet printing device remains idle for a period of time.
12. The method of claim 1, further comprising performing a recovery procedure in the event that said operating characteristics of said plurality of nozzles are not sufficient to meet said level of print quality.
13. The method of claim 12, wherein said recovery procedure comprises a sequence of a plurality of different servicing procedures, and further wherein at least one of said plurality of different servicing procedures is repeatable, based on its recovery effectiveness.

14. An inkjet printing device for printing on a medium comprising:
a processor for determining a level of print quality required for a received print job, wherein
said level of print quality is based on a set of flexible criteria;
an ink drop detector for detecting the operating characteristics of a plurality of nozzles to be
used to print said print job;
said processor further being capable of comparing said operating characteristics of said
plurality of nozzles to said required level of print quality for said print job, and in the event, based
on the comparison, that said operating characteristics of said plurality of nozzles are sufficient to
meet said level of print quality, causing said inkjet printing device to print said print job.
15. The inkjet printing device of claim 14, wherein said set of flexible criteria includes a
resolution of said print job.
16. The inkjet printing device of claim 14, wherein said set of flexible criteria includes a
printmode of said print job.
17. The inkjet printing device of claim 14, wherein said set of flexible criteria includes a
setting of said inkjet printing device.
18. The inkjet printing device of claim 14, wherein said set of flexible criteria includes an
amount of media area required for said print job.
19. The inkjet printing device of claim 14, wherein said processor operates to schedule a
maintenance procedure in the event that one or more of said nozzles is not fully functional.
20. The inkjet printing device of claim 19, wherein said processor operates to perform
said maintenance procedure during a time when said inkjet printing device is idle.

21. The inkjet printing device of claim 19, further comprising a printhead cleaning device, wherein said maintenance procedure includes performing a wiping procedure on said pen utilizing said printhead cleaning device.

22. The inkjet printing device of claim 14, further comprising a printhead cleaning device, wherein after printing said print job, said processor operates to perform a wiping procedure on said pen utilizing said printhead cleaning device in the event that a predetermined number of ink drops per nozzle has been exceeded.

23. The inkjet printing device of claim 14, further comprising a printhead cleaning device, wherein after causing said inkjet printing device to print said print job, said processor operates to perform a wiping procedure on said pen utilizing said printhead cleaning device in the event that said inkjet printing device remains idle for a period of time.

24. The inkjet printing device of claim 14, wherein said processor operates to perform a recovery procedure in the event that said operating characteristics of said plurality of nozzles are not sufficient to meet said level of print quality.

25. The inkjet printing device of claim 24, wherein said recovery procedure comprises a sequence of a plurality of different servicing procedures, and further wherein at least one of said plurality of different servicing procedures is repeatable, based on its recovery effectiveness.

26. The method of claim 1, wherein said step of printing is carried out without first performing any maintenance procedure.

27. The method of claim 1, wherein said step of determining is capable of determining that said print job and another print job have the same level or different levels of print quality.